

REMARKS

This is a full and timely response to final Office action mailed November 9, 2005. Reexamination and reconsideration in view of the foregoing amendments and following remarks is respectfully solicited.

Claims 1-29 are now pending in this application. Claims 1, 8, 9, 11, 14, 19, and 25 being the independent claims. Claims 1-7 and 19-24 have been withdrawn from consideration. Claims 8-18, 25-27 and 29 have been rejected. Claim 28 has been objected to. Claims 8-11, 14-17, 25-27 and 29 have been amended to more particularly claim the invention. Claim 28 has been amended to overcome the objection. No new matter is believed to have been added.

REJECTION UNDER 35. U.S.C. §102

Claims 14-18 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 6,341,485 (Liebe). The Examiner in making this rejection states that the previously removed "supplying air" in amended Claim 14, now renders Claims 14-18 anticipated by Liebe. The Examiner asserts that Liebe clearly anticipates the recitations "a first end.....and located proximate a rear end/exhaust end of the combustor chamber, and a second end.....and located proximate a front end/intake of the combustor chamber" now included in the independent claims. These rejections are respectfully traversed, at least in light of the above claimed amendments.

The applicant has amended Claim 14 to include the statement that "the exhaust end of the combustor and the intake end of the combustor are located at opposed ends of the combustor liner for uni-directional flow of a fluid through each of the plurality of single chamber serpentine cooling tubes. The applicant believes that this limitation on the placement of the exhaust end and the intake end of the combustion chamber, thereby providing uni-directional flow through the cooling tube is not anticipated by the

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disclosure of Liebe.

The applicant's claimed cooling tube and system having a single chamber cooling tube defined so that the fluid flow through the chamber is uni-directional. The tube extends from an exhaust end of the combustor to an intake end of the combustor, where the exhaust end of the combustor and the intake end of the combustor are located at opposed ends of the combustor chamber for uni-directional flow of a fluid through each of the plurality of single chamber cooling tubes. There is no rigid attachment of a dual chamber system in which the exhaust end and intake end are located at a single end of the combustor chamber such as that disclosed in Liebe. The applicant's proposed single chamber cooling tube eliminates stresses formed in the system due to the temperature difference between the two chambers of the cooling tube of Liebe.

The Applicant believes that these amendments place Claim 14 in a condition for allowance. No new material has been added by the amendments presented herein. Support for the amendments can be found in the specification and in particular in the FIGs. The dependent Claims 15-18, depending therefrom respectively, are also submitted to be patentable for the reasons given above with respect to the independent claim from which each depends, and because each recites features which are patentable in its own right.

REJECTION UNDER 35. U.S.C. §103

Claims 8-13, 25-27, and 29 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,341,485 (Liebe) in view of U.S. Patent No. 2,446,059 (Peterson).

These rejections are respectfully traversed, at least in light of the above claimed amendments. Although the Applicant again disagrees with the Examiner's allegation of obviousness, for the purposes of expediting the prosecution of this application, the

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Applicant has further amended Claims 8-11, 25-27 and 29 to more particularly claim the invention. The Applicant previously amended the claims to define the positioning of the first end of the cooling tube(s) as being located proximate the exhaust (rear) end of the combustor chamber and the second end of the cooling tube(s) as being located proximate the intake (front) end of the combustor chamber. The Applicant has further amended the claims to now define the location of the exhaust end and the intake end of the combustion chamber. More specifically, the Applicant has amended Claims 8, 9, 11, and 25 to state that the exhaust end of the combustor and the intake end of the combustor are located at opposed ends of the combustor chamber/liner for uni-directional flow of a fluid through the cooling tubes. The Applicant believes that these amendments place the claims in a condition for allowance over the disclosure of Liebe as described with regard to the 35 USC 102 rejection above, and when further modified by the teaching of Peterson. The dependent Claims 10, 12-13, 26, 27 and 29, depending therefrom respectively, are also submitted to be patentable for the reasons given above with respect to the independent claim from which each depends, and because each recites features which are patentable in its own right. No new matter has been added by the amendments presented herein.

Liebe (U.S. Pat. No. 6341,485)

Liebe discloses a combustion chamber including a wall structure having an inner wall forming an internal space through which combustion gasses flow from a chamber inlet to a chamber outlet. The combustion chamber further includes an outer wall, wherein the inner wall and the outer wall define an envelope therebetween. An intermediate wall is disposed in the envelope and defines a dual chamber or dual cooling spaces, namely an inner cooling space and an outer cooling space. A cooling fluid inlet in the outer cooling space is located proximate the combustion chamber inlet, and a cooling fluid outlet in the inner cooling space is also located proximate the combustion chamber inlet. Accordingly, the fluid inlet and the fluid outlet are located at the same end of the combustion chamber. The two cooling spaces in Liebe are defined by the intermediate wall and thus can be said to be rigidly attached to each other. This rigid attachment will generate stresses dependent on the temperature difference between the two cooling spaces. One cooling space is exposed to the hot combustion gasses and the

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second to a much cooler cooling fluid. Thus one space and the defining wall(s) is much hotter than the other and has a much higher thermal growth than the other. The Applicants alleviate the stress issue by providing the cooling with essentially a single cooling space, referred to as a single chamber as shown in the drawing and that the serpentine in the tube relieves the stresses because it has waves to absorb the thermal growth.

In contrast to Liebe, the Applicants' now claimed combustion chamber includes a cooling tube or cooling tubes, each having a first end and a second end, wherein said first end is located proximate the exhaust (rear) end of the combustion chamber (the chamber outlet in Liebe) and said second end is located proximate the intake (front) end of the combustion chamber (the chamber inlet in Liebe). More specifically, the Applicants inventive cooling tube design as now claimed provides for the first end and second end to be positioned at opposite ends of the combustion chamber, and having a one-way flow of the cooling fluid (air) therethrough. More particularly, the flow of air, in contrast to the gas flow in Liebe, is counter to the flow of a hot gas stream through the combustion chamber. There is no inclusion in the Applicants device of a dual cooling space structure including a rigid structure that is not able to withstand thermal growth.

The Applicant asserts that the mere substitution of air into the design of Liebe in lieu of the preferred cooling gas, fails to make obvious the Applicants now claimed uni-directional flow of air through the cooling tube(s) wherein an intake and outtake of the cooling tubes are located at opposed ends of the combustion chamber.

Therefore, since Claims 8, 9, 11, and 25 each contain the same limitation and since that limitation is not taught, disclosed, shown, or made obvious in light of the teaching of Liebe in view of Peterson, a 35 U.S.C. §103 cannot be maintained. Accordingly, the Applicant believes that Claims 8, 9, 11, and 25 as amended should be allowable. Since Claim 10 is dependent upon Claim 9, Claims 12 and 13 are dependent upon Claim 11, and Claims 26, 27 and 29 are dependent upon Claim 25, then Claims 10, 12, 13, 26, 27, and 29 should also be allowable.

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Therefore, based on the above-presented arguments, the Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. §103.

OBJECTION

The Examiner has objected to Claim 28 as being dependent upon a rejected base claim, but stated that Claim 28 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. According, Claim 28 has been rewritten in independent form including all the limitation of the original base claims. It is believed that this amendment places Claim 28 in a condition for allowance.

CONCLUSION

Based on the above, independent Claims 8, 9, 11, 14, and 25 are patentable over the citations of record. The dependent claims are also submitted to be patentable for the reasons given above with respect to the independent claims and because each recite features which are patentable in its own right. Individual consideration of the dependent claims is respectfully solicited

Hence, Applicant submits that the present application is in condition for allowance. Favorable reconsideration and withdrawal of the objections and rejections set forth in the above-noted Office action, and an early Notice of Allowance are requested.

If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

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If for some reason Applicant has not paid a sufficient fee for this response, please consider this as authorization to charge Ingrassia, Fisher & Lorenz, Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

INGRASSIA FISHER & LORENZ

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